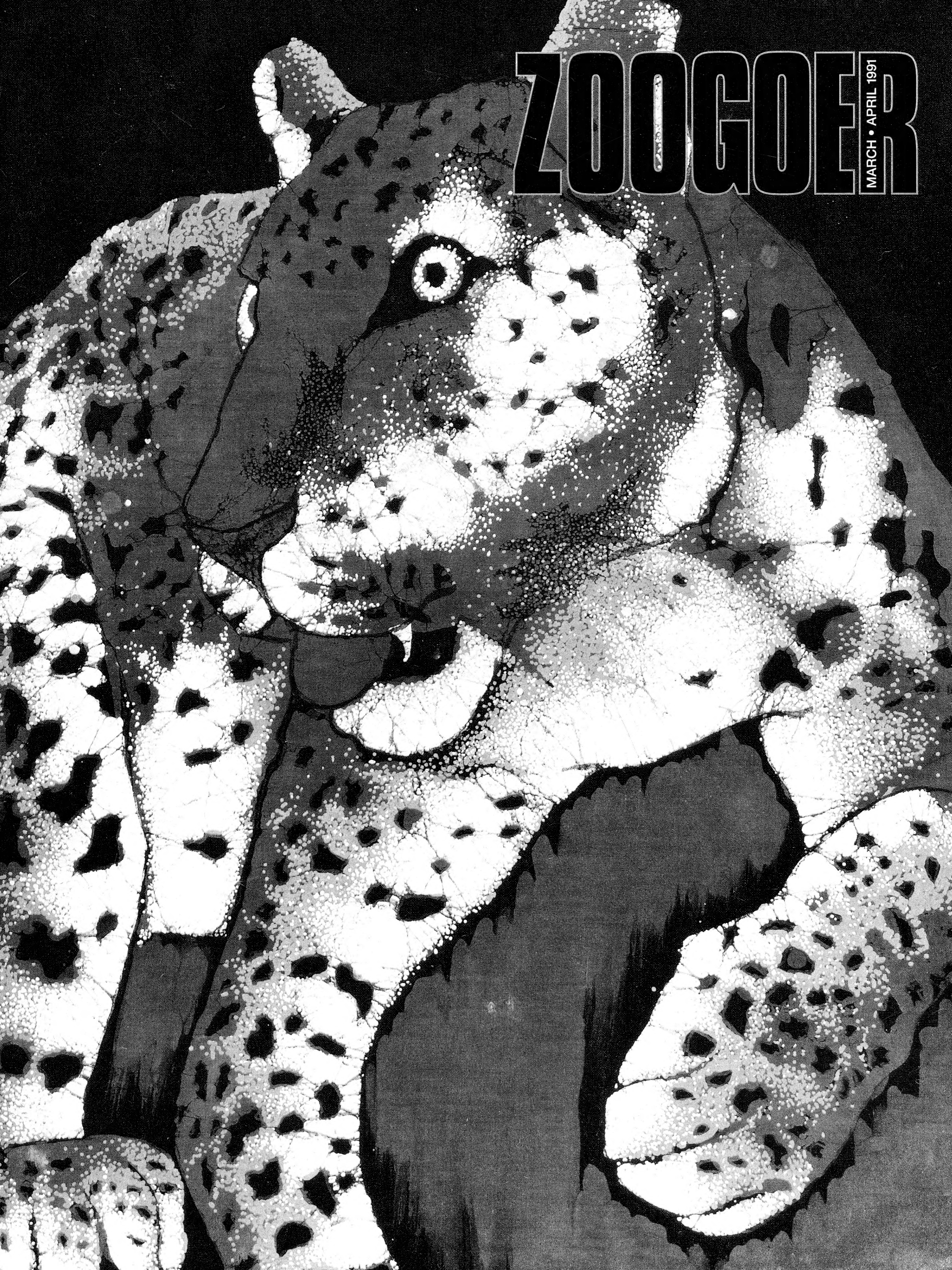
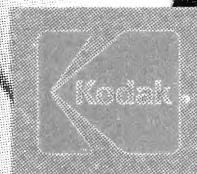


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MARCH • APRIL 1991



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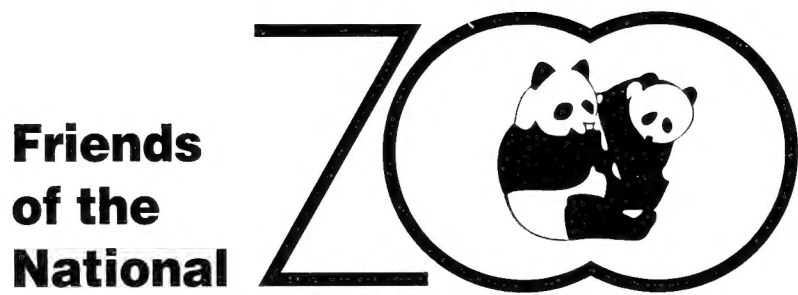
CATS: *Special Issue*



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Ward Merritt and Susan Lumpkin



is a nonprofit organization of individuals, families, and organizations who are interested in helping to maintain the status of the National Zoological Park as one of the world's great zoos, to foster its use for education, research, and recreation, to increase and improve its facilities and collections, and to advance the welfare of its animals.

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Centerspread: *Feline Fantasia* by Jane Gaston.
(Photo by Geri Bauer/Jellybean Photographic.)

Facing Page: Caracal. Cincinnati Zoo and Botanical Garden.

Feline Fantasia

Cheetahs, the fastest mammals on earth, may be losing the race for survival. Fewer than 15,000 of these graceful speedsters exist in the wild.

Only a few hundred Asian lions still prowl the forests of India, a tiny remnant population of a species that once roamed over three continents and now exists in good numbers only in sub-Saharan Africa.

Bali's tigers became extinct in the 1940s, Java's in the early 1980s. Now the tigers of Sumatra and south China are on the brink, and the future of none of the world's tiger populations is secure.

A bleak picture? Yes, but not one without a ray of hope. Scientists at the National Zoological Park are working desperately to save these endangered cats in zoos and in the wild and to spread the word about their peril. Their accomplishments and their goals are highlighted throughout this special *ZooGoer* issue on cats.

But they can't do it alone, so I hope all of you will turn out for National ZooFari, our annual gala fundraiser on May 16, 1991. Proceeds will support the Zoo's wide-ranging cat conservation programs and BioPark exhibits featuring tigers and lions and other cats.

ZooFari proceeds will also help bring endangered cheetahs to the Zoo next year. The cheetahs will live in a new grassland exhibit while Zoo scientists attempt to repeat with cheetahs the research that produced the world's first "test-tube" tigers.

Highlighting the world's endangered cats in a "Feline Fantasia," ZooFari is a good cause—and a great party! From 6:30 to 11:00 p.m., the Zoo will rock with music for all tastes, from steel band to big band to the Motown sound of The Drifters and Martha Reeves.

More than 70 of the area's finest restaurants, including Dominique's, Galileo, Occidental, and Sign of the Whale, have volunteered to serve their specialties, and beverages will flow courtesy of Calvert Woodley Liquor.

And between dining and dancing, guests will be able to watch the Zoo's cats; bid on such one-of-a-kind Silent Auction items as the chance to name the next baby cat born at the Zoo, and behind-the-scenes tours of the Lion/Tiger Exhibit where winners can get truly close to the Zoo's big cats; and enter the ZooFari Sweepstakes to win a safari to see big cats in the wild.

FONZ members like you have always been strong supporters of ZooFari, and your participation has grown steadily. This year, I hope even more members will show their support for the Zoo and its efforts to save cats—and enjoy a spectacular evening at the Zoo. Tickets for ZooFari are only \$75 each for members and \$90 for nonmembers, a bargain for fine dining, great entertainment, and the good feeling of helping cat conservation. So mark the date on your calendar, spread the word to your friends and neighbors, and call 202-332-WILD today to reserve your place at Feline Fantasia: a wild party to help save the wild.

Clinton A. Fields
Executive Director



Of the world's some 4,000 species of mammals, fewer than one percent are cats. In absolute numbers, cats form a still smaller percentage of the mammalian fauna. But these 37 species occupy a position of importance vastly disproportionate to their numbers. Superbly adapted predators and pure carnivores, cats stand at the top of the food chain. Distributed nearly worldwide (Australia and Antarctica being the major exceptions), cats influence the ecology, behavior, and evolution of countless prey species, with ramifying effects on entire ecosystems. And cats loom large in human history and imagination. From being the rather helpless prey of big cats, we have become their only significant predator, a role that now threatens their survival. In the following pages we offer a glimpse into the world of cats, and what is being done to save it.

CATS

Cats of the World

All unmistakably cats, with remarkably similar basic body plans, the 37 species of living felids each exhibit unique adaptations for survival. Differences between species—in morphology, physiology, and behavioral ecology—arise pri-

marily from differences in the size of their prey and where they stalk it. Cats also exhibit wide variation in coat color, patterning, and density. Coat color and patterning may have signal functions for communication within and between species, and may vary to serve as effective camouflage in differing habitats. The density of fur is adapted to the climate in the species' range; cats living in the coldest climates possess the longest, thickest fur, while that of tropical species tends to be short and thin.

Tigers are the largest members of the felid family, and the Siberian tiger is the largest and most massively built subspecies.

Equipped with a coat of thick fur and a deep layer of insulating fat to survive the subzero temperatures of the eastern USSR and northeast China, the Siberian tiger can measure more than 13 feet from its nose to the tip of its tail and sometimes weighs

more than 700 pounds. Unfortunately, the Siberian tiger's beautiful fur is highly prized by poachers, and fewer than 350

remain in the wild. Pictured here is one of the approximately 1,000 Siberian tigers residing in the world's zoos.



Minnesota Zoological Garden

Family Felidae

Cheetah

Acinonyx jubatus

Size: 45 to 60 inches;

77 to 158 pounds

Distribution: Sub-Saharan Africa, possibly Iran

African golden cat

Felis aurata

Size: 24 to 40 inches;

11 to 27 pounds

Distribution: west Africa and central Africa

Borneo bay cat

Felis badia

Size: 20 to 24 inches;

weight not known

Distribution: the island of Borneo

Leopard cat

Felis bengalensis

Size: 17 to 42 inches; 7 to 16 pounds

Distribution: throughout much of south and east Asia

Chinese desert cat

Felis bieti

Size: 27 to 33 inches;

weight not known

Distribution: central Asia

Jungle cat

Felis chaus

Size: 20 to 30 inches; 9 to 35 pounds

Distribution: Middle East; south Asia

Pampas cat

Felis colocolo

Size: 24 to 28 inches; 7 to 14 pounds

Distribution: Ecuador to Argentina

Puma

Felis concolor

Size: 42 to 78 inches;

80 to 187 pounds

Distribution: populations from Canada to Argentina

Geoffroy's cat

Felis geoffroyi

Size: 18 to 28 inches; 5 to 13 pounds

Distribution: Bolivia to Argentina

At the other end of the spectrum from the Siberian tiger is the tiny black-footed cat of southern Africa. This smallest wild felid is also smaller than a domestic cat, measuring from 14 to 16 inches from its nose to the base of its tail and weighing no more than about four and a half pounds. Despite its size, the black-footed cat has a reputation for ferocity. Reports of the small cat attacking and fastening itself to the neck of sheep, goats, and even giraffes have never been confirmed,



Jill D. Mellen

however. In truth, the black-footed cat (named for the black pads on the bottom of its feet) hunts small rodents, lizards, and beetles.

The jaguarundi, native to North, Central, and South America, is not very catlike in appearance. German zoologists refer to this short-legged,



Jill D. Mellen

long-bodied animal as the “weasel cat,” and in some areas of Mexico the jaguarundi is known as the “otter cat.” Jaguarundis have short, smooth, unspotted coats of a uniform color, but this color varies among individuals from blackish- to brownish-gray and from chestnut to orange-red. Unlike the spotted cats of Texas and Central and South America, the jaguarundi is rarely hunted for its fur. However, destruction of habitat is beginning to threaten the species, and real-estate development has reduced the United States’ jaguarundi population to a few cats in Arizona, New Mexico, and southwest Texas.

Kodkod

Felis guigna

Size: 15 to 20 inches; 5 to 6 pounds

Distribution: small area of Chile and Argentina

Iriomote cat

Felis iriomotensis

Size: 20 to 24 inches; 7 to 10 pounds

Distribution: Iriomote Island (Japan)

Andean mountain cat

Felis jacobita

Size: 23 to 25 inches; 9 pounds

Distribution: small area of the high Andes in Peru, Bolivia, Chile, and Argentina

Pallas’ cat

Felis manul

Size: 20 to 26 inches; 6 to 8 pounds

Distribution: central Asia

Sand cat

Felis margarita

Size: 18 to 23 inches; 5 to 7 pounds

Distribution: north Africa, southwestern Asia

Marbled cat

Felis marmorata

Size: 18 to 24 inches; 5 to 11 pounds

Distribution: southern Asia

Black-footed cat

Felis nigripes

Size: 14 to 16 inches; 3 to 4.5 pounds

Distribution: southern Africa

Ocelot

Felis pardalis

Size: 34 to 39 inches;

25 to 35 pounds

Distribution: Texas and Arizona to northern Argentina

Flat-headed cat

Felis planiceps

Size: 16 to 20 inches; 4 to 5 pounds

Distribution: Borneo, Sumatra, Thailand, and Malaysia

Rusty-spotted cat

Felis rubiginosa

Size: 14 to 19 inches; 3 to 5 pounds

Distribution: India and Sri Lanka



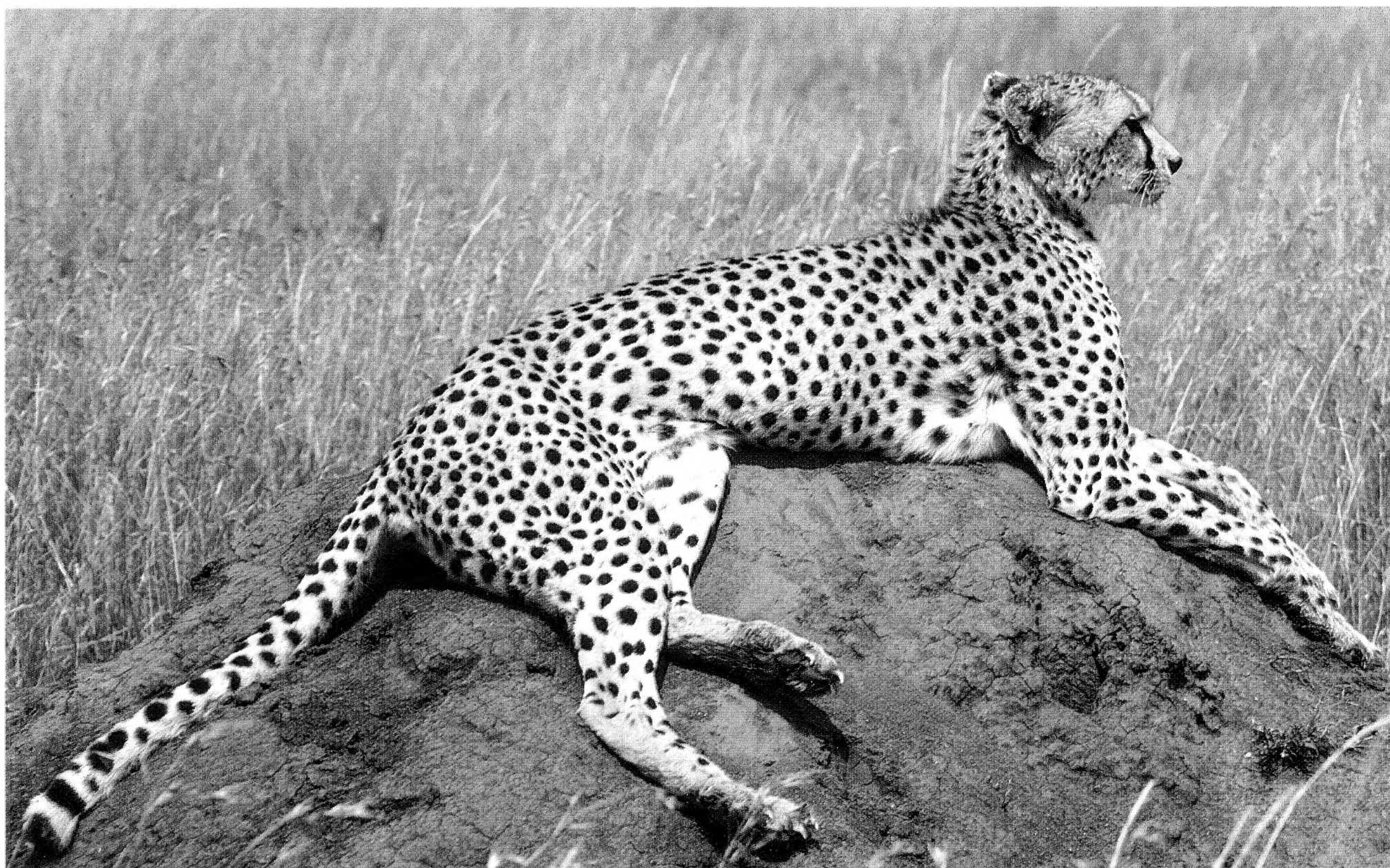
Cincinnati Zoo and Botanical Garden

Only slightly larger than the average domestic cat, Pallas' cat wears a coat of fur that is longer and more dense than that of any other wild cat. The thick coat is an adaptation to the harsh climatic conditions of its home in the central Asian steppe country. The rare and little-known Pallas' cat is characterized by a flat head profile and short, rounded, widely spaced ears, which scientists believe are adaptations to stalking in the open country of the steppes.

Eminent 19th-century biologist St. George Mivart said that the cheetah differs much more from all other cats than any two other cats differ from one another. For example, the cheetah's paws appear much more dog-like than catlike: the pads are

small and tough and the claws are blunt, only slightly curved, and lack the sheaths that cover the retracted claws of other cats. Cheetahs also lack the powerful canine teeth possessed by all other cats. Behaviorally, the cheetah is an exception to

the felid rule of solitary social structure (lions and feral domestic cats are the other notable exceptions), with some males forming small groups that live and hunt together for life. The cheetah is the sole member of the genus *Acinonyx*.



Robert Blumenschine

Serval

Felis serval

Size: 27 to 40 inches;

18 to 40 pounds

Distribution: Africa

Wild cat

Felis silvestris

Size: 20 to 30 inches; 7 to 18 pounds

Distribution: parts of Europe,

Asia, Africa

Asian golden cat

Felis temmincki

Size: 20 to 24 inches;

27 to 33 pounds

Distribution: tropical and

temperate Asia

Oncilla

Felis tigrina

Size: 16 to 22 inches; 4 to 6 pounds

Distribution: Costa Rica to

northern Argentina

Fishing cat

Felis viverrina

Size: 26 to 34 inches;

17 to 31 pounds

Distribution: tropical to

subtropical Asia

Margay

Felis wiedii

Size: 19 to 31 inches; 6 to 9 pounds

Distribution: southern Texas to

northern Argentina

Jaguarundi

Felis yagouaroundi

Size: 20 to 30 inches; 7 to 13 pounds

Distribution: Arizona and Texas to

northern Argentina

North American lynx

Lynx canadensis

Size: 32 to 39 inches;

11 to 38 pounds

Distribution: Canada and Alaska

Caracal

Lynx caracal

Size: 24 to 41 inches;

29 to 42 pounds

Distribution: Africa, Asia



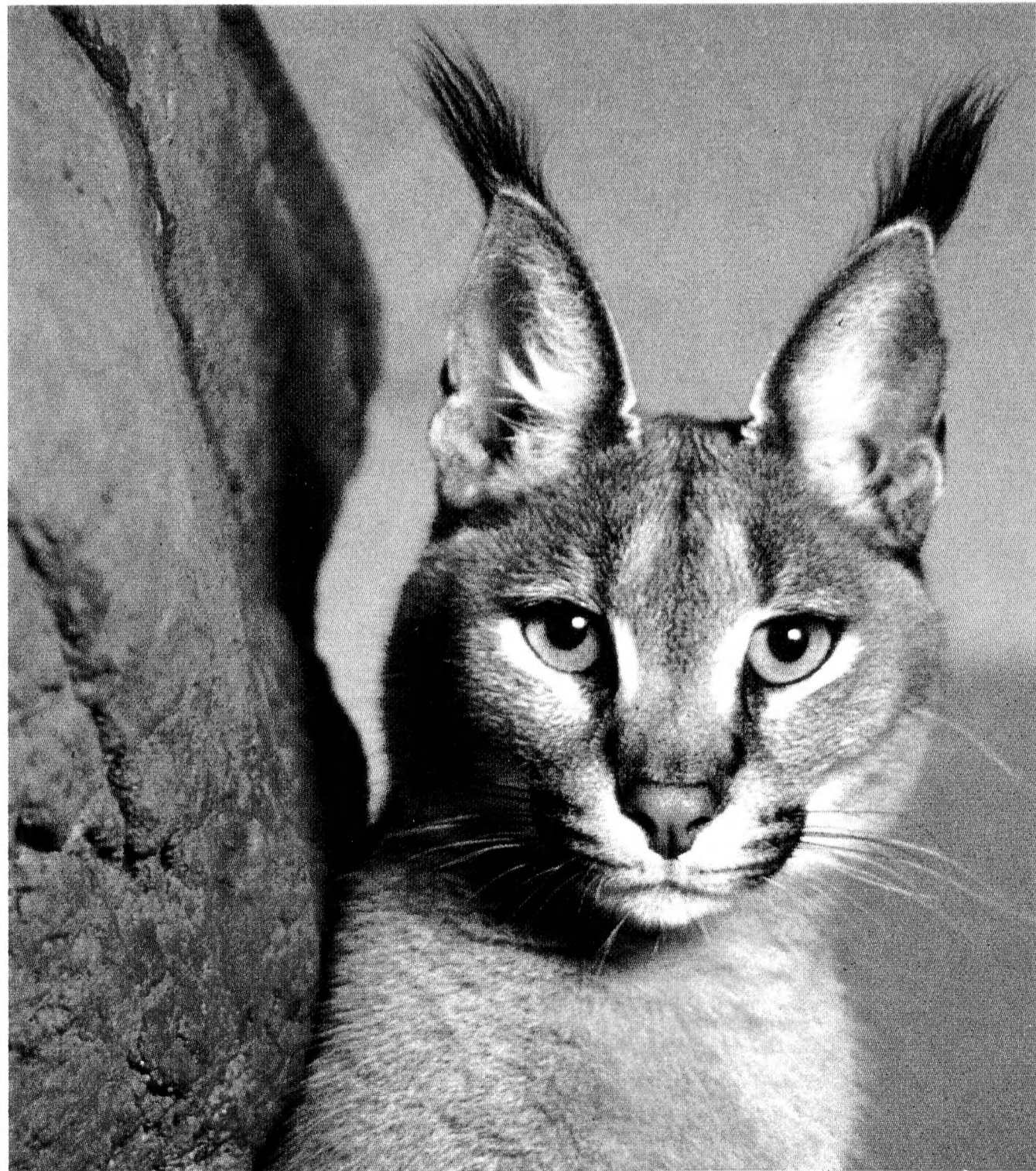
Fiona Sunquist

A beautiful spotted cat, the ocelot ranges from south Texas through Central and South America. Weighing about 25 pounds, ocelots live on one- to four-square-mile territories in forested habitats where they

prey primarily upon small rodents. Every night, ocelots must actively search their territory for prey whose small size demands that ocelots capture several meals daily to survive. Until they were protected by CITES (Con-

vention on International Trade in Endangered Species), ocelots were rapidly declining in numbers as their pelts were widely sought by furriers. Even with protection, they remain rare throughout their wide range.

Ranging throughout dry habitats in Africa and the Middle East as far as India, caracals are the only members of the genus *Lynx*, which includes the bobcat and the North American lynx, with a tropical distribution. Caracals are also the smallest of the lynxes and the only ones without spotted fur. As a result, caracals are not sought for their pelts and appear to be relatively abundant where they occur. The prominent ear tufts characteristic of caracals and other lynxes are an adaptation to their primary use of the sense of hearing, rather than of sight or smell, in finding prey.



Cincinnati Zoo and Botanical Garden

Eurasian lynx
Lynx lynx
Size: 32 to 51 inches;
18 to 84 pounds
Distribution: Europe, Asia

Spanish lynx
Lynx pardinus
Size: 34 to 44 inches;
25 to 29 pounds
Distribution: Iberian Peninsula

Bobcat
Lynx rufus
Size: 26 to 42 inches; 9 to 34 pounds
Distribution: southern Canada to central Mexico

Clouded leopard
Neofelis nebulosa
Size: 37 inches; 35 to 51 pounds
Distribution: southern Asia

Lion
Panthera leo
Size: 56 to 100 inches;
264 to 550 pounds
Distribution: Africa and India

Jaguar
Panthera onca
Size: 45 to 73 inches;
79 to 248 pounds
Distribution: southwestern North America to Argentina

Leopard
Panthera pardus
Size: 36 to 75 inches;
62 to 198 pounds
Distribution: Africa, Asia

Tiger
Panthera tigris
Size: 55 to 110 inches;
165 to 673 pounds
Distribution: Asia

Snow leopard
Panthera uncia
Size: 39 to 51 inches;
55 to 165 pounds
Distribution: central Asia

All lengths are head and body measurements only.

Ancestors and Relatives

One of ten living terrestrial families in the order Carnivora, the felids branched off the carnivore line about 50 million years ago. Since then, many species of felids, including several species of saber-toothed cats, have arisen, flourished, and become extinct. Among the carni-

*vores, felids are most closely related to hyenas and civets, and only distantly related to canids, bears, and raccoons. Unlike other carnivore families, in which at least some members have adapted to diets that may include insects, fruit, or plant material, all species of felids rely almost exclusively on vertebrate prey. The family Felidae includes five species of large cat in the genus *Panthera*, five in the genus *Lynx*, one each in *Acinonyx* and *Neofelis* (the cheetah and the clouded leopard), and 25 mostly small cats in the genus *Felis*.*

Defending its meal from the onslaught of several Ice Age vultures, this saber-toothed cat

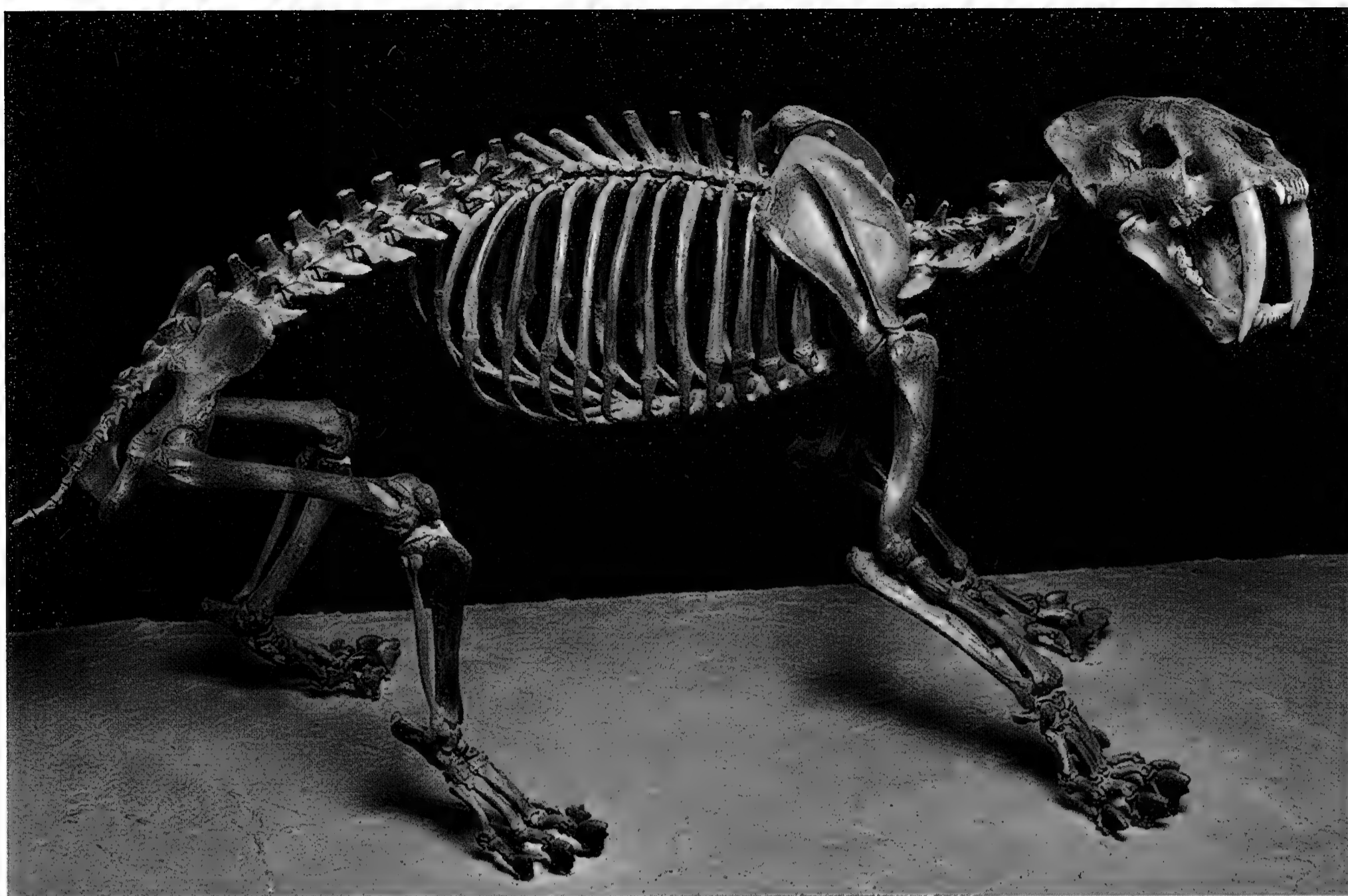
(*Smilodon fatalis*) has a more pressing problem: The same tar pit that holds its hapless quarry was also the likely cause of the *Smilodon*'s own death. The action in this scene, painted by Charles R. Knight, whose studies of Pleistocene animals can be seen in natural history museums throughout the country, takes place in California's La Brea Tar Pits. These natural preserving pits have yielded the fossils of well over a million plants and animals, including approximately 1,000 partial and complete skeletons of *Smilodon*.



Trans. No. 993. Courtesy Department of Library Services; American Museum of Natural History

Mistakenly called “saber-toothed tigers,” true saber-toothed cats were part of a now-extinct evolutionary line of felids that was long distinct from that of tigers and other modern cats. Pictured here is the skeleton of *Smilodon fatalis*, an Ice Age cat of North and South America that represented the end point of saber-tooth evolution. As massive as the modern lion, *Smilodon* probably used its huge canine teeth for stabbing and slashing attacks on the large herbivores of its time. To ensure full use of

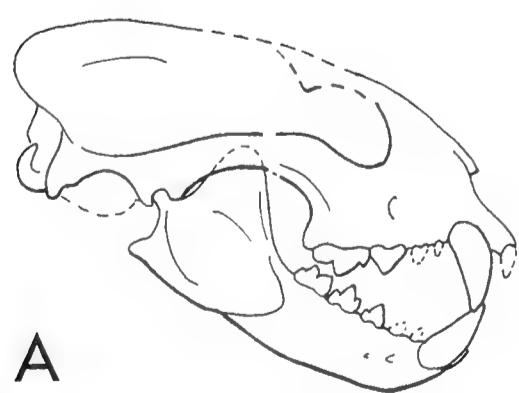
these saber-teeth, *Smilodon* was capable of opening its jaws to an angle of about 90 degrees.



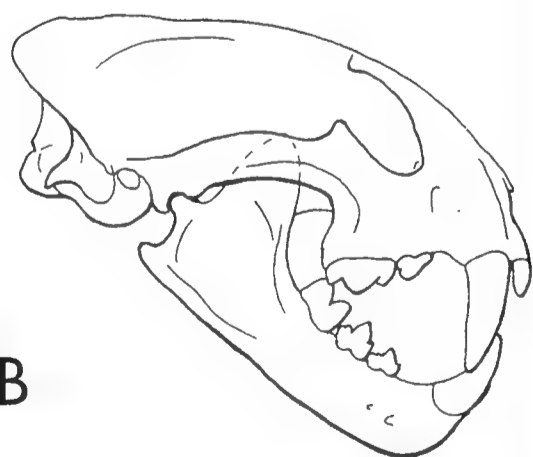
Chip Clark/National Museum of Natural History

Skull A, below, belonged to *Proailurus lemanensis*, an animal that paleobiologists consider to be among the earliest members of the modern cat family. Appearing in Europe approximately 25 million years ago, *Proailurus* had fairly long limbs and a very long tail, and probably looked like a cross between a cat and a civet. Skull B

(*Neofelis nebulosa*), a species that is endangered but still very much alive. Despite some differences, the skulls are remarkable in their similarity, demonstrating how little cats have changed over the millennia. UCLA biologist Blaire Van Valkenburgh explains the evolution of felids succinctly, “They are extremely conservative, but they are also highly successful.”

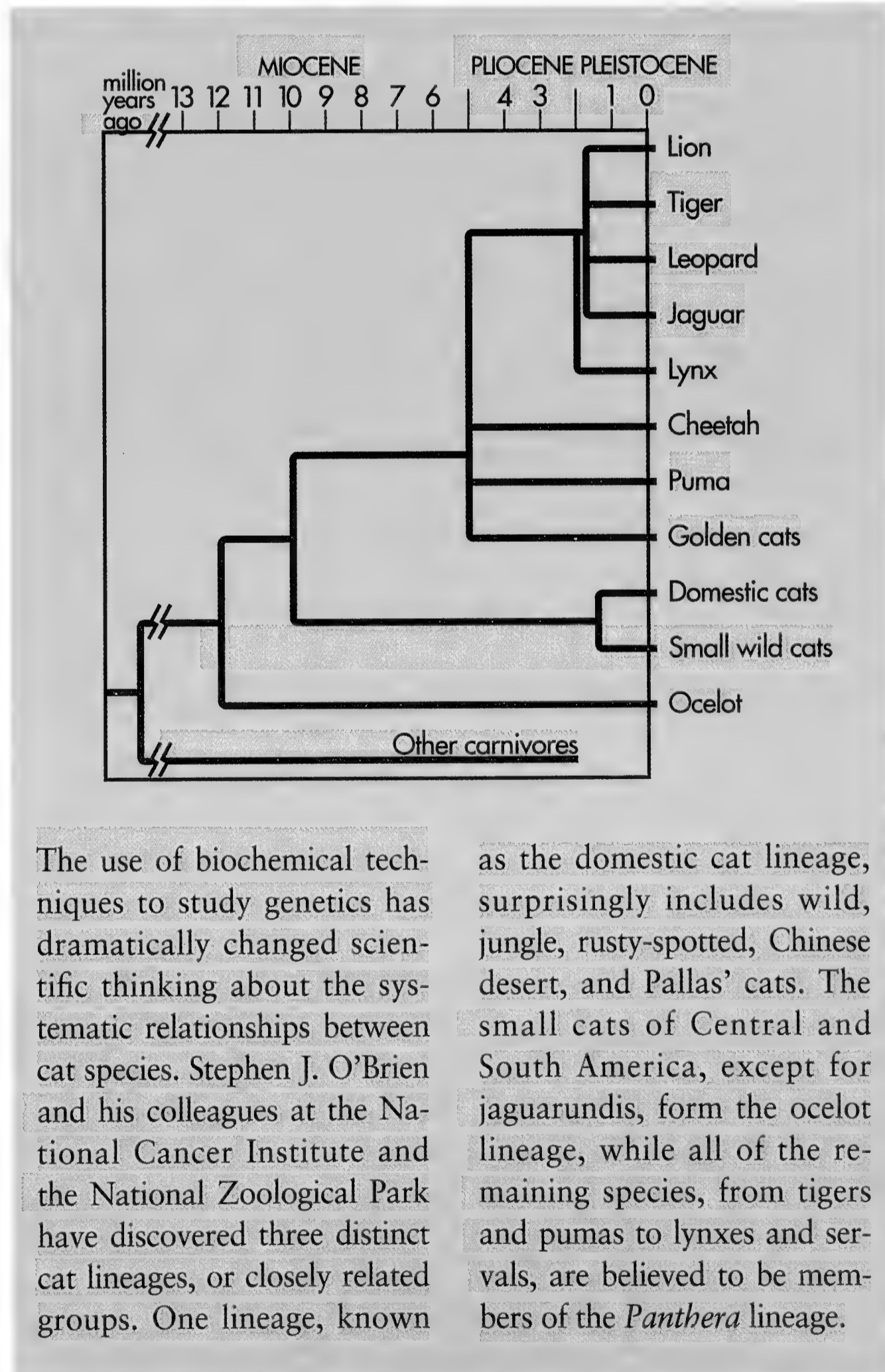


A



B

The Paleontological Society



The use of biochemical techniques to study genetics has dramatically changed scientific thinking about the systematic relationships between cat species. Stephen J. O'Brien and his colleagues at the National Cancer Institute and the National Zoological Park have discovered three distinct cat lineages, or closely related groups. One lineage, known

as the domestic cat lineage, surprisingly includes wild, jungle, rusty-spotted, Chinese desert, and Pallas' cats. The small cats of Central and South America, except for jaguarundis, form the ocelot lineage, while all of the remaining species, from tigers and pumas to lynxes and servals, are believed to be members of the *Panthera* lineage.

A Cat's Life

From the tiny black-footed cat to the huge Siberian tiger, the felid body plan is about the same: lithe, compact, and deep-chested, with a rounded head dominated by reflective eyes and deadly sharp canine teeth. All cats are adapted to a predatory lifestyle and most are also broadly similar in other aspects of ecology and behavior—although there are exceptions to virtually every generalization. But little is known about most species of cats. Many have never been

studied in the wild or in zoos, and two species are known only from museum specimens and rare sightings.

Adult cats usually live and hunt alone on relatively large, exclusive territories that are defended against same-sex intruders. A male's territory may overlap those of several females, but no groups exist other than a mother and her young. This is a typical felid pattern, but lions break all the rules. Lions live in prides of from a few to 40 males, females, and cubs. Related fe-

males—mothers, daughters, sisters, and aunts—are the core of the pride. Up to five or six males, usually related to one another, form coalitions to take over and maintain female prides. Takeover and defense often involve potentially fatal combat between male coalitions. Coalitions rarely remain in control of a pride for more than a few years.



John Cavallo



Fiona Sunquist

Like most cats, jaguars are secretive, nocturnal, and solitary hunters who use stealth to find and capture prey in forest habitats. Although agile climbers, jaguars hunt almost entirely on the ground. In fact, only a few cats, including the margay and perhaps the clouded leopard, are truly arboreal hunters. Most cats are also surprisingly good swimmers, and jaguars, tigers, and fishing cats actually spend much time in, or near the edges of, rivers.



Cincinnati Zoo and Botanical Garden

A fishing cat and her two kittens. With the exception of lions, male cats play no role in raising young. Female cats do it alone, usually giving birth in a secluded den to between one and four blind and helpless

young. A mother must leave the kittens or cubs to hunt for herself, but returns regularly to nurse them. While in and around the den, the growing cubs play, practicing the social and hunting

skills they will need as adults. Later, cubs follow their mother on hunting trips, gradually improving their skills and their ability to survive on their own. Young cats become independent at one to two years of age.



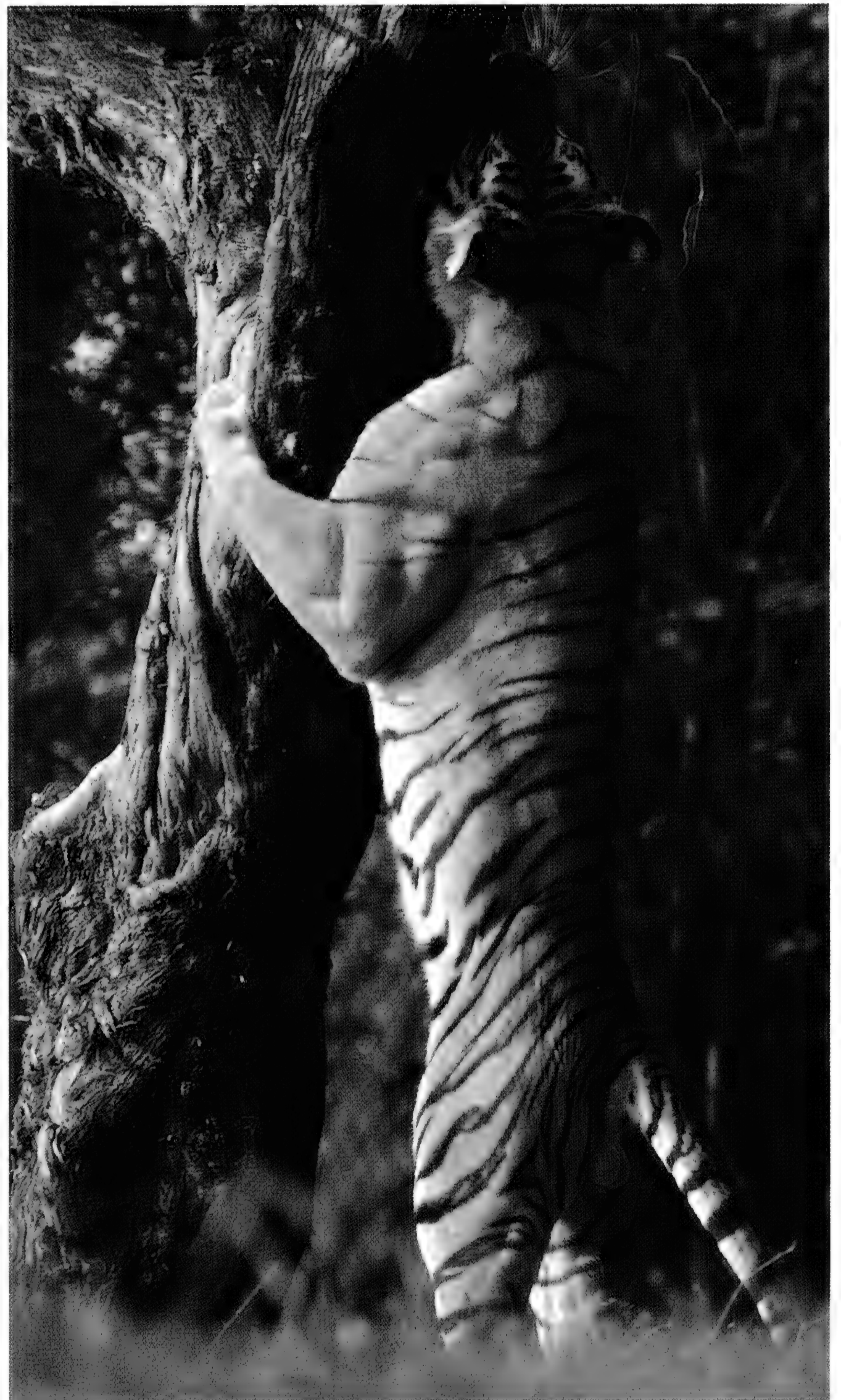
Joseph L. Fox; International Snow Leopard Trust

While primarily creatures of the forest, cats occupy a variety of other habitats around the world. Sand cats and Chinese desert cats are adapted to arid environments, and lions and cheetahs thrive in open savannas. Snow leopards, pictured here, live in the steep, rugged terrain of central Asia's high mountainous regions. Until recently, their remote, inhospitable habitat provided the snow leopards

with security from hunters, trappers, and human agricultural encroachment. Today, however, pastoralists in search of grazing land for increasing numbers of domestic livestock are moving into the snow leopard's domain. What's more, high black-market prices for the snow leopard's beautiful pelt provide a huge incentive for poachers, who are often poor local people with few economic opportunities.

Cats may be largely solitary, but living alone does not preclude regular social interactions, albeit indirect ones. Tigers, for instance, communicate with other tigers by leaving scent marks throughout their territories. Tigers spray urine on bushes and trees, scrape bare patches of

ground, deposit feces in prominent places, and, as this tiger is doing, leave scratch marks on trees and similar objects. The various marks communicate information about territorial occupancy as well as about an individual tiger's sex, reproductive condition, and identity.



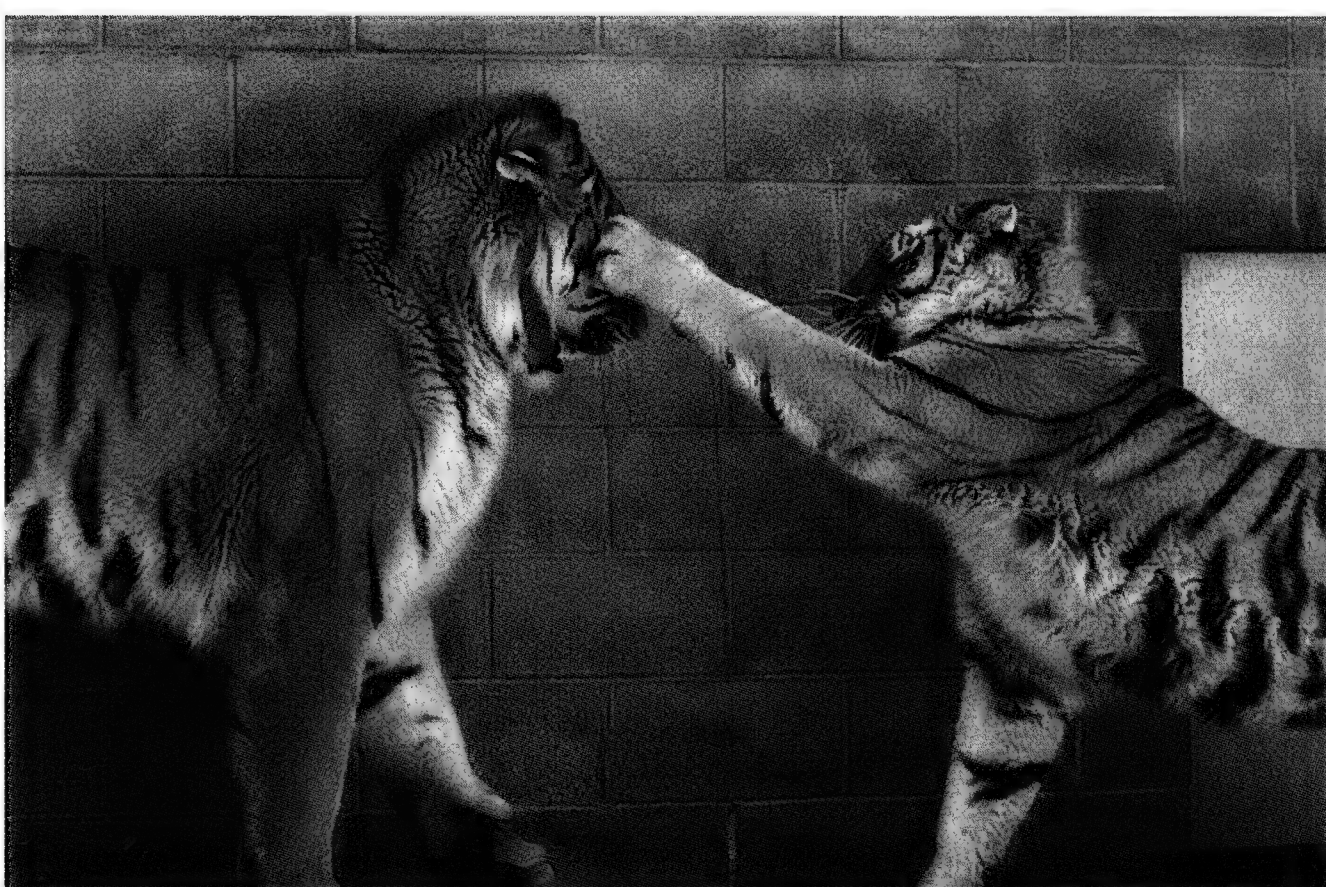
Fiona Sunquist



Fiona Sunquist

This flat-headed cat's "eyeshine" is the result of light being reflected from the *tapetum lucidum*, which lies outside the receptor layer of the retina. Any light not absorbed by retinal receptors is reflected back to stim-

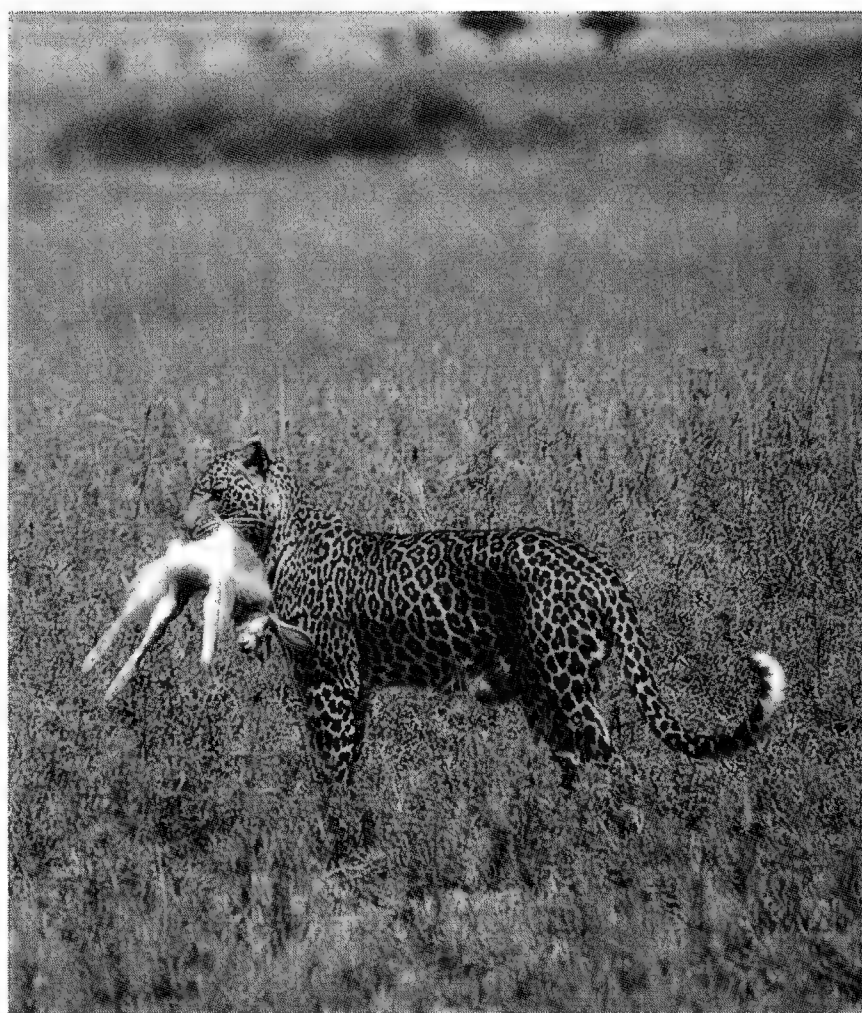
ulate the receptors again. This helps cats to see up to six times more acutely than humans under low-light conditions. In daylight, cats, which possess binocular and color vision, see about as well as humans. The little-known flat-headed cat inhabits forest and scrub in Borneo, Sumatra, Thailand, and Malaysia.



Ron Tilson

Siberian tigers mating at the Minnesota Zoo. Male cats monitor scent marks and vocalizations to determine a female's impending sexual receptivity. A courting male follows and tries to approach the female, who initially aggressively rebuffs him. But the male persists for

several days until the female is truly in estrus, and actual copulation takes place. During a single estrus, which lasts about three days in most cats, a male and female may copulate hundreds of times. The male and female then resume their pattern of mutual avoidance.



John Cavallo

A leopard at the end of a hunt. Prey capture in most cats follows a similar sequence. After a slow, stealthy stalk, cats put on a burst of incredible speed to close the gap between hunter and hunted. Then the cat pounces to grab and bring down the prey before using its canines to deliver a killing bite to the back of the prey's neck or grasping its throat to suffocate it.

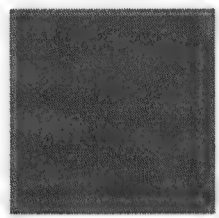
Holding the title of "world's fastest land animal," cheetahs are capable of speeds of up to 70 mph over distances of several hundred yards. The cheetah's flexible spine functions like a spring, coiling and uncoiling to launch the cat forward. As this

photo indicates, a sprinting cheetah is almost literally flying—studies show that all four feet are simultaneously off the ground for about half the chase. The long tail acts as a rudder, permitting maneuverability at high speeds.



Karl Ammann

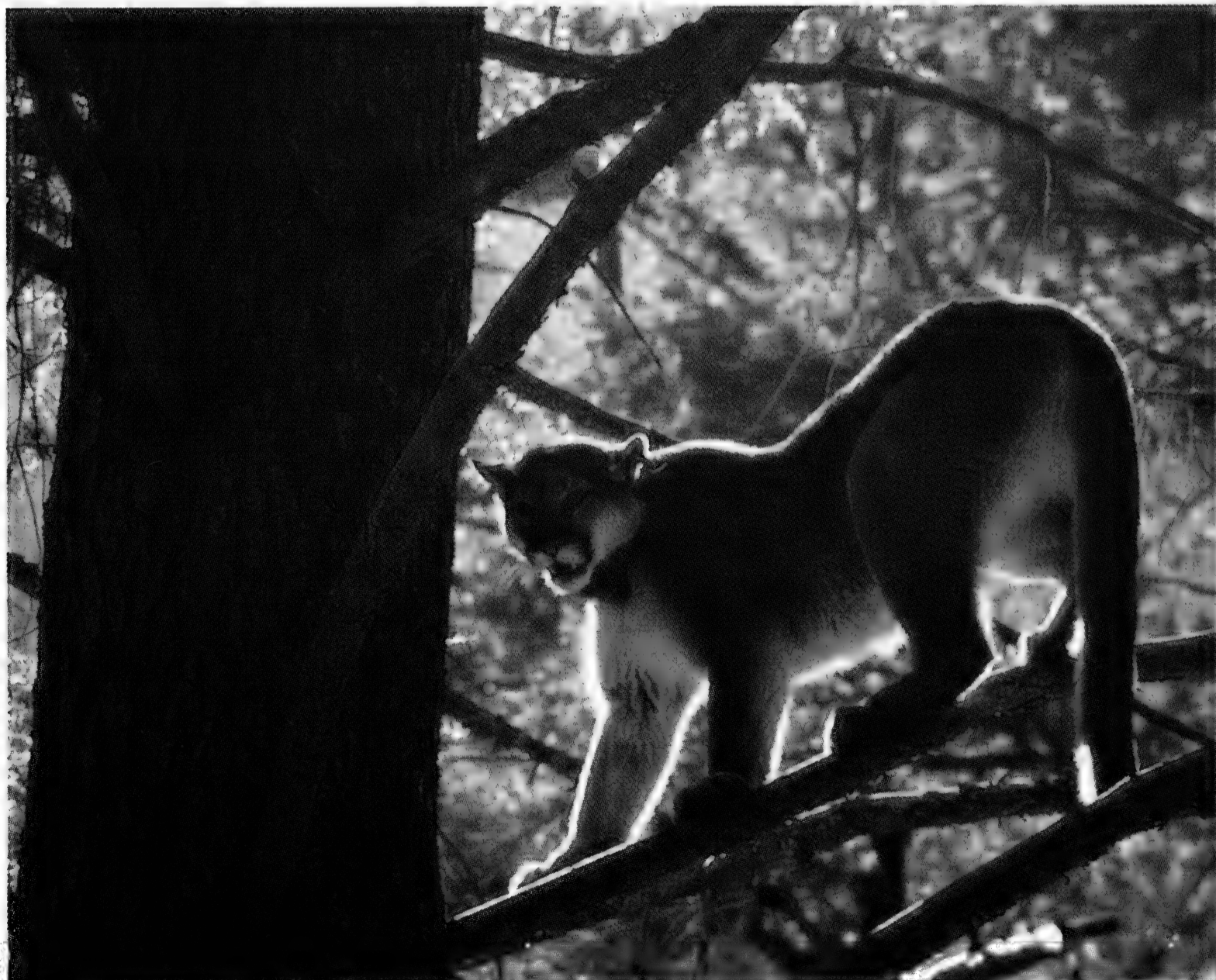
Cats on the Map



Cats occupy terrestrial habitats virtually the world over; only Australia, Antarctica, and a few islands lack native wild cats. A few species are extremely wide-ranging. Leopards inhabit most of Africa and Asia, pumas much of North, Central, and South America, and various subspecies of wild cat (the ancestor of domestic cats) range throughout Europe, Africa, and Asia. Other species occupy very restricted areas. Bay cats live only on the island of Bor-

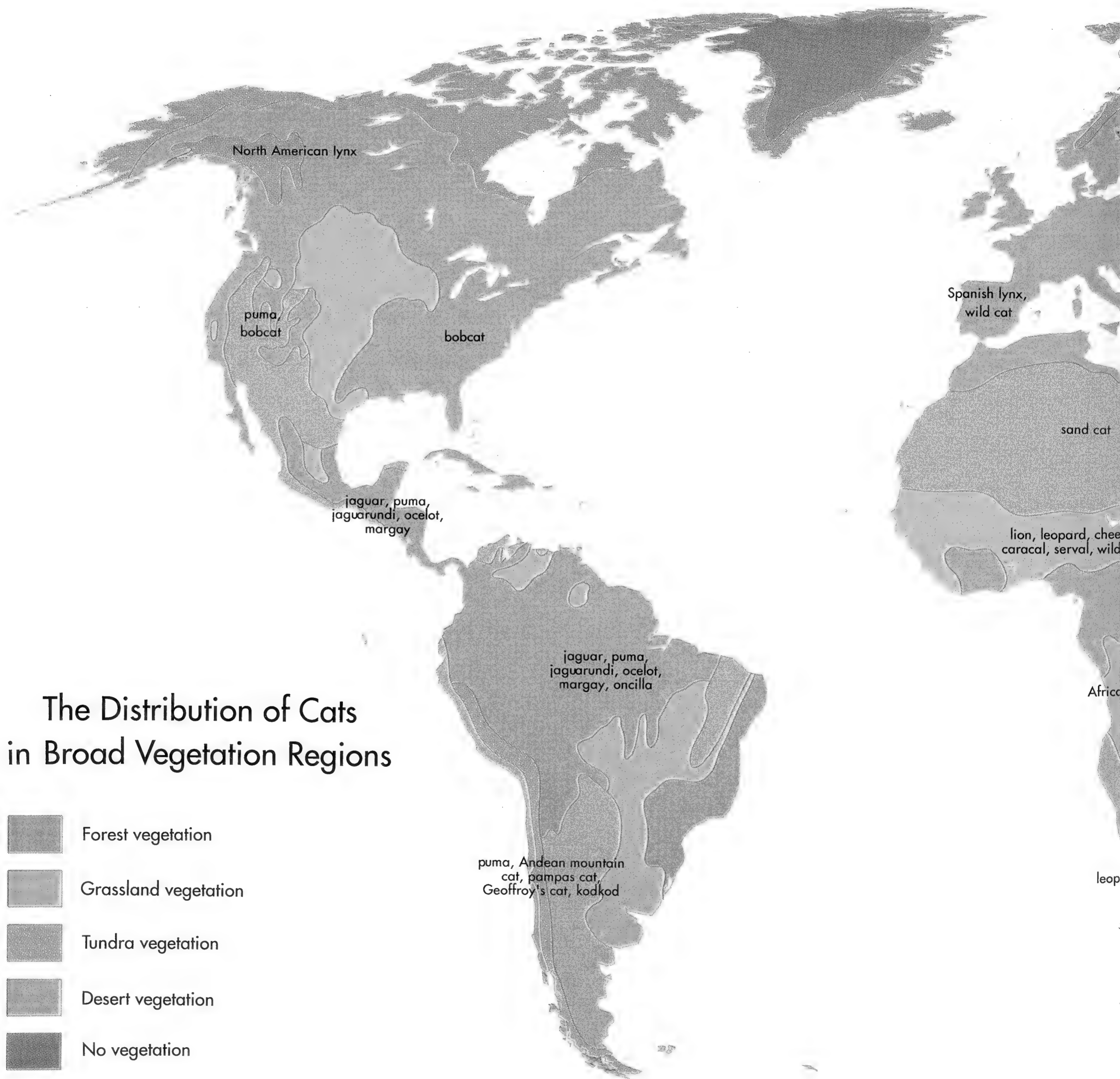
neo, black-footed cats live only at the southern tip of Africa, and kodkod and Andean mountain cats only in the southern Andes. The center of felid diversity and abundance, Asia is home to 19 species, and in a few areas, such as Thailand, Sumatra, and western Sichuan, China, eight or nine species occur together.

The map depicts the current distribution of the world's cats, which for some species is much reduced from their historic distribution. Cheetahs, for instance, now confined to sub-Saharan Africa, ranged throughout the Middle East and as far as northern India as recently as 100 years ago. And 12,000 years ago, lions were found in virtually every corner of the earth, occupying the Americas, all of Europe, the Middle East, northern Asia to Siberia, and southern Asia as far as India and Sri Lanka.



The wide-ranging puma.

John Seidensticker









jane@

Predator and Prey

Cats take a wide variety of prey, ranging in size from mouse to buffalo. Small cats, those weighing less than about 45 pounds, primarily eat small rodents, rabbits and hares, and birds. These prey are generally much smaller than the cats eating them, so small cats must often capture several meals each day. In contrast, the seven medium-sized and large cats that prey primarily on hoofed mammals such as deer and antelope may need to make kills only a few times each week. Pumas and other medium-sized species that prefer deer-sized prey—and are capable of taking down prey far larger than themselves—can also survive on rodents and birds when big game is scarce. For lions and tigers, however, abundant large prey is essential.



John Seidensticker

The puma has been described as having a little cat's head on a big cat's body, a body plan that gives the puma enormous

flexibility to survive seasonal and latitudinal changes in habitat and prey availability across its vast American distribution. During winter in the western United States, pumas take ungulate prey such as deer and elk weighing as much as 700 pounds, up to seven times the puma's own weight. Summer, however, finds the puma living largely on two-pound ground squirrels, pictured here, and other rodent prey.



John Cavallo

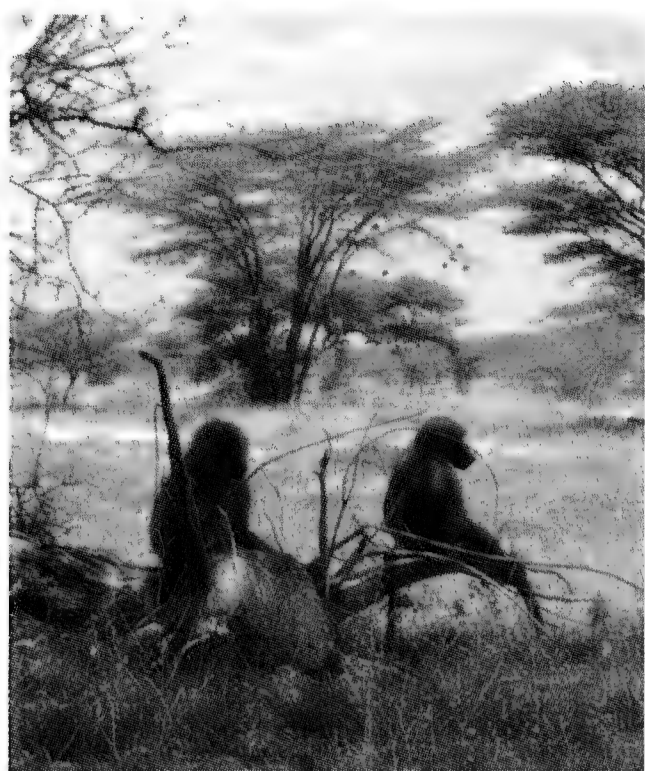
Mainstays in the diet of East Africa's lions, wildebeest (*Connochaetes taurinus*) live in huge herds numbering in the thousands. As the wildebeest migrate across the Serengeti, they provide superabundant food for the lions whose territories they pass through. By living in such large groups and giving birth in synchrony, so that female wildebeest flood the plains with calves, an individual wildebeest decreases the relative

probability of itself or its offspring becoming a lion's meal.



John Cavallo

One of the most abundant of East Africa's antelopes, the graceful Thomson's gazelle (*Gazella thomsoni*) seems to be perfect carnivore food. Lions, leopards, and cheetahs, as well as hyenas, jackals, wild dogs, and raptors, all prey on the "Tommies." Living in groups of up to 200, the gazelles are ever alert to danger and mill about warily when a predator is detected, bursting into a high-speed running escape only when the cat begins its rush to capture one of the herd's members.



Susan Lumpkin

At night, while baboons (*Papio*) rest rather helplessly in their sleeping trees, they easily fall victim to hunting leopards. On the ground in the light of day, however, baboons are able to fend off stalking leopards, whose cubs may even become the prey of powerful adult male baboons. Although

rarely preferred prey items, primates are often taken by tigers, lions, leopards, and cheetahs when ungulate prey is scarce. Big cats may also make human primates their prey when cats and people live in close proximity. Man-eaters, whether lion, tiger, or leopard, are usually cats who, due to old age or other infirmity, are unable to hunt effectively for ungulates and thus turn to more easily captured people for survival.



Robert Blumenschine

Even the largest of predators are sometimes prey. In Tanzania's Serengeti National Park, spotted hyenas (*Crocuta crocuta*, pictured here), lions, jackals, and birds of prey kill more than half of the 90 percent of cheetah cubs that do not survive to three months of age. Spotted hyenas and wild dogs also kill the cubs of lions and leopards, and, hunting in groups, steal the kills of single adult lions, leopards, and cheetahs. Some features of these

cats may have evolved to counter hyenas. When hyenas are present, leopards store kills in trees—and, with their cubs, spend most of their time above ground out of the hyenas' reach. The cheetah's large litter size—up to eight young at birth—may have evolved to ensure that at least a few cubs survive predation and other sources of mortality. And some speculate that group living in lions arose to counter the threats posed by group-living hyenas.



Fiona Sunquist

A jaguar coming across these basking caimans (*Caiman crocodilus*) and a river turtle would see two of its reptilian prey species. Jaguars are excellent swimmers and spend a fair amount of time in water, but their attacks on caimans appear to be restricted to land, where these large reptiles are relatively

helpless. When feeding on river turtles, the jaguar usually breaks the animal's carapace, but some observers report the cat delicately scooping out meat without ever cracking the shell. The trade in turtle meat and caiman skins has forced the jaguar into a losing battle with humans over these important food sources.

The graceful chital (*Axis axis*) of India, Nepal, and Sri Lanka has been called the world's most beautiful deer. For reasons having little to do with aesthetics, the Bengal tiger is also appreciative of the chital, numbering the deer among its

preferred prey animals. Chitals inhabit the glades and grasslands of the forest edge and weigh between 130 and 200 pounds. Scientists estimate that a single adult tiger needs to make 40 to 50 large chital-sized kills per year, and a tigress with young must annually make 60 to 65. Although the tiger by no means lives on chital alone, the big cat does play an important role in the ecology of this Asian deer.



Fiona Sunquist

At the Zoo

Always popular with visitors, cats were among the first animals exhibited at the National Zoo and remain prominent in the Zoo's collection. The Zoo exhibits seven species, and one more, the clouded leopard, lives at the Zoo's Conservation and Research Center in Front Royal, Virginia. In 1991, cheetahs and jaguarundis will be added to the collection.

But the National Zoo does much more than merely display cats for the public. The Zoo participates in Species Survival Plan breeding programs, coordinated by the American Association of Zoological Parks and Aquariums, to preserve endangered cats in zoos. Zoo scientists, with collaborators from all over the world, study the behavior, ecology, reproductive physiology, and genetics of endangered cats in zoos and in the wild. Using this knowledge, they are developing solutions to the problems of cat conservation, ranging from high-tech methods for artificial reproduction to fitting the needs of cats into human economic development projects. Friends of the National Zoo helps support these wide-ranging efforts, and works to educate people about the plight of the world's cats.



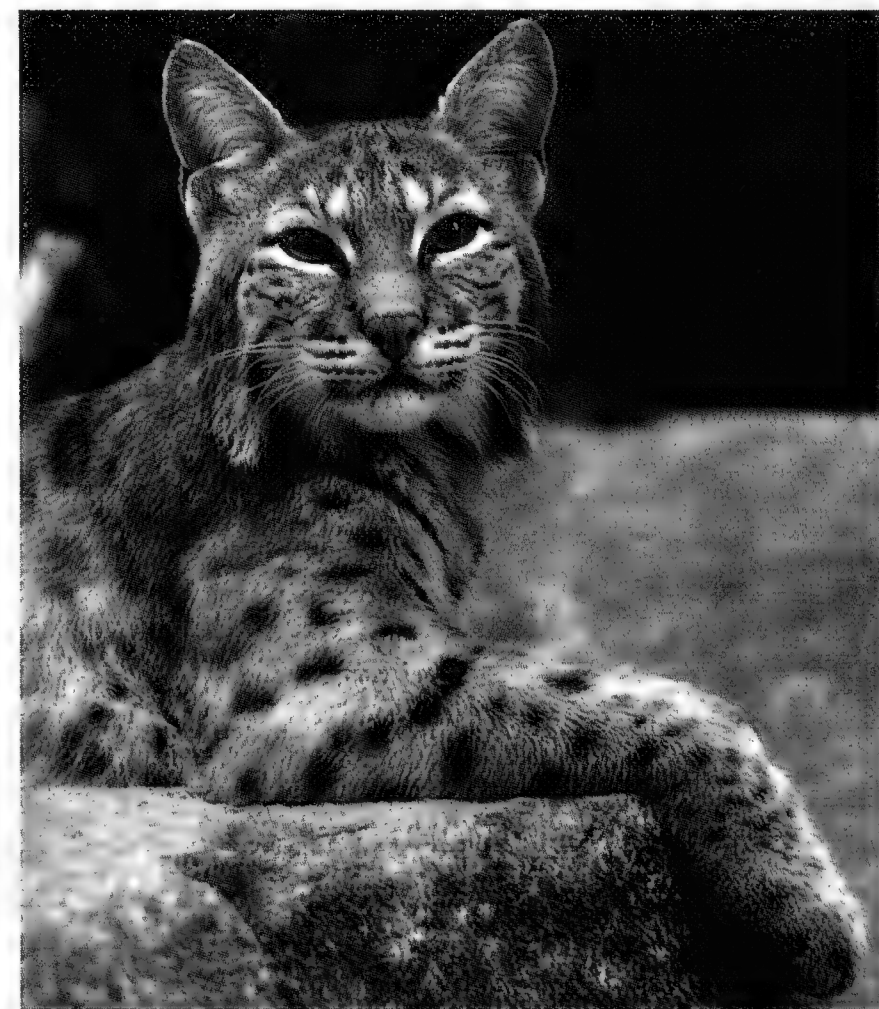
Jessie Cohen/NZP Graphics

Black leopards, like this one at the Zoo, actually possess normal spots, but the ground color is so dark that the spots can only be seen when light hits them at just the right angle. As part of a larger study of the genetics of zoo and wild leopards, Zoo scientists discovered that the spot

pattern on the face, forehead, and throat varies among individual leopards. While not as perfect as human fingerprinting, the distinctive spot patterns provide a fairly reliable means of identifying leopards. Similarly, whisker spots have been used to identify individual lions.

The bobcat is one of the most numerous wild cats in the Americas. This small cat, whose range includes most of the United States, has adapted to a variety of prey and habitat. At times, wild bobcats are even present in Washington, D.C., entering through the natural conduit of Rock Creek Park and its connected greenways. The National Zoo has had a long and fruitful association with the bobcat, which is named for its short, stubby tail. In 1902, President Theodore

Roosevelt's annual gift of animals to the Zoo included a bobcat. The Zoo's current pair of bobcats has produced four litters, the most recent in 1988.



Milton H. Tierney, Jr.



Jessie Cohen/NZP Graphics

The National Zoo is one of only 12 North American institutions exhibiting the rare Sumatran tiger. As participants in the Species Survival Plan for this last remaining island subspecies, NZP scientists hope that the Zoo's pair of Sumatran tigers will someday produce offspring to add to the 162 animals now residing in the world's zoos. Island tigers are smaller than their

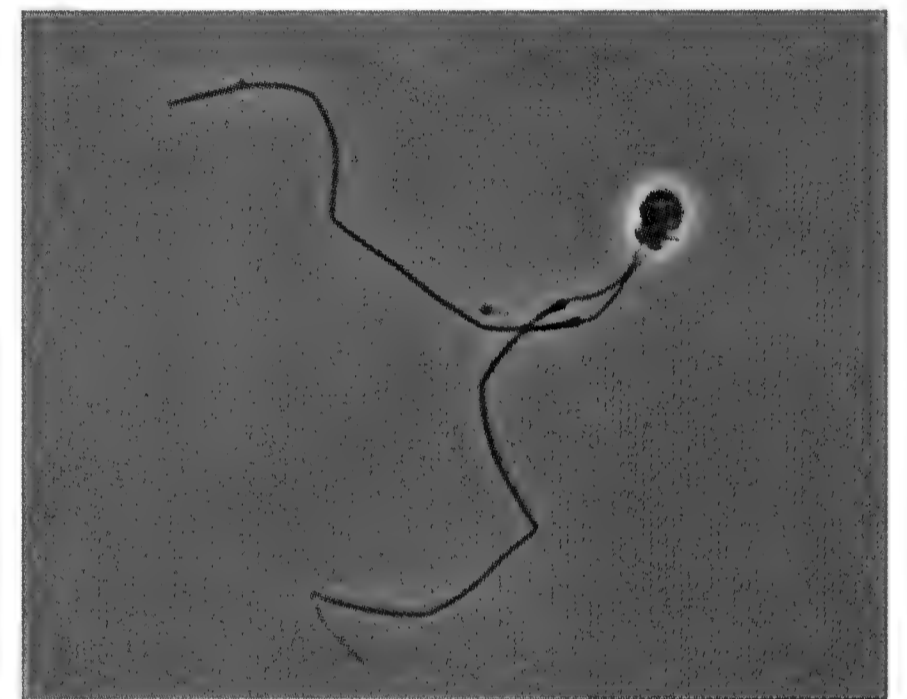
mainland relatives—at 250 pounds, the Zoo's male Sumatran tiger (pictured here) weighs about half as much as the more commonly seen Bengal tiger. The Sumatran tiger also has a deeper-red background coat color and more numerous and closely spaced stripes than mainland tigers. Scientists estimate that only 400 to 600 animals remain in the wild.



In screening cheetah blood proteins and DNA, scientists at the Zoo's Center for New Opportunities in Animal Health Sciences (NOAHS Center) found that these cats suffer from an extraordinary lack of genetic diversity that may threaten the species' survival.

Scientists hypothesize that for some unknown reason the cheetah population declined to the brink of extinction about 10,000 years ago. Inbreeding inevitably followed, and this photo of an abnormal, two-tailed cheetah

sperm is indicative of the genetic and reproductive problems that are the result of that evolutionary bottleneck. NOAHS scientists hope that, with increased research and careful management, it will not be too late to save these elegant creatures from extinction.



JoGayle Howard

Cheetahs at the National Zoological Park

"This gentle and elegant cat" is how the New York Zoological Society's George Schaller describes the cheetah (*Acinonyx jubatus*). With a slight build, trim waist, long slender legs, and small round head, the cheetah epitomizes an animal built for speed: "A greyhound with the coat of a leopard," Schaller calls it.

First exhibited at the National Zoo in 1913 and last here in 1980, cheetahs are about to return. A new cheetah conservation research exhibit, located near the Zoo's Education Building, will open in the spring of 1992. The first cheetahs will arrive in late 1991, when renovations to accommodate cheetahs are completed on the old Hardy Hoofed Stock Exhibit, but the public opening is delayed to give newly planted exhibit areas time to establish. By mid-1992, 10 cheetahs will reside in the new facility, together with Grevy's zebra (*Equus grevyi*), dorcas gazelle (*Gazella dorcas*), dama gazelle (*Gazella dama*), African crowned cranes (*Balearica regulorum*), and blesbok (*Damaliscus dorcas*).

Why 10 cheetahs? The National Zoological Park has been selected as an intensive cheetah research site. The Cheetah Species Survival Plan (SSP), prepared by participating members of the American Association of Zoological Parks and Aquariums,

summarized the need for intensive research on cheetahs this way: "Problems with survival and reproduction have characterized the captive cheetah for years and seem to be growing worse." The Cheetah SSP has thus embarked on a program of systematic and coordinated research to enhance fecundity, reduce mortality, and produce a self-sustaining zoo population that can be managed as a backup to ensure the survival of the cheetah in the wild. A research team led by David Wildt of the Zoo's Department of Animal Health is heading up the reproductive physiology portions of this research effort. In addition, these cheetahs will be part of studies on nutrition, behavior, genetics, and infectious diseases.

Visitors saw cheetahs at the National Zoo nearly continuously from 1913 until 1980. No young were ever produced at the National Zoo and this mirrors the experience of most other zoos. The first cheetah cubs in North America were born in Philadelphia in 1956. In the three decades that followed, 417 cubs were born in 113 litters, but 37 percent died before reaching six months of age. The North American population had grown to about 200 animals by 1986, with zoo births supplemented by im-



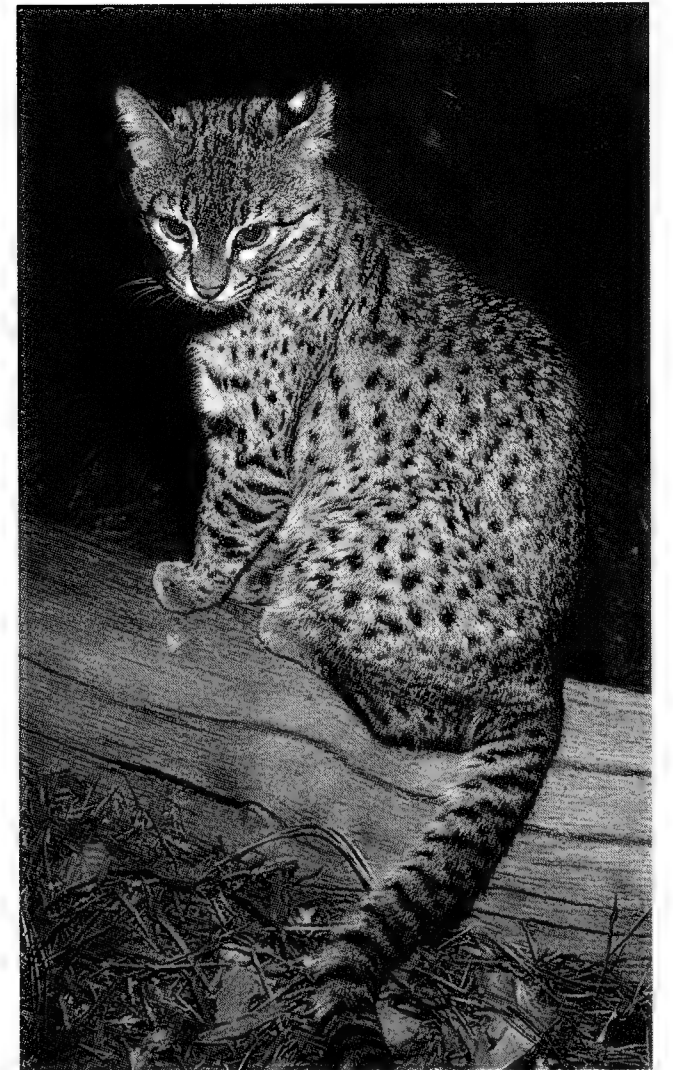
Cincinnati Zoo and Botanical Garden



Milton H. Tierney, Jr.

A bright moment in the spring of 1990 was the birth of three servals at the National Zoo, the first kittens born here since 1970. Earlier, the Zoo recorded the first successful serval birth ever in North America. In the wild, servals inhabit the African savannas, using excellent hearing to hunt among the tall grass for rodents and other small prey. At present, servals appear to be relatively abundant and face no strong threats to their survival.

During 1991, Zoo staff expect to add a breeding pair of jaguarundis to their roster of cats. They will live in the Forest Carnivore area.



Jessie Cohen/NZP Graphics

Geoffroy's cats, little-known natives of South America, are among the few small cats that breed well in zoos. Most other species exist in the world's zoos only in very low numbers (or not at all), and, with current levels of breeding success, many zoo populations will soon become extinct. At the same time, none of the world's small cats have been well-studied in the wild and biolo-

gists can only hazard guesses about the conservation status of most species.

portation of zoo-born and wild-caught animals. Then, between 1982 and 1986, the zoo birthrate declined by 50 percent, prompting the Cheetah SSP's concern and its concerted efforts to determine what was wrong and to take necessary corrective actions.

The cheetah has not had trouble only in zoos. Some long-time cheetah watchers recognized more than two decades ago that the cheetah was endangered in the wild. In historic times, cheetahs ranged through the dry areas of Africa and the Arabian Peninsula, Asia Minor, and as far east as India. The last wild cheetah in India was reportedly shot in 1952. At least nine of the National Zoo's first cheetahs came from Cairo and Algiers but there are no wild cheetahs north of the Sahara today.

In the 1950s and 1960s the geographic range of the cheetah virtually collapsed as they were hunted for their skins. Schaller reported that a total of 3,168 cheetah skins were imported into the United States alone in 1968-69, as many as normally would be found in nearly 100,000 square miles in Africa. In the early 1970s, conservationist Norman Myers estimated the total world population to be about 14,000 animals, half of what it had been 15 years earlier.

The hemorrhage to cheetah populations caused by the spotted-cat skin trade was effectively blocked with the Convention on International Trade in Endangered Species (CITES), which

became effective in 1975. But the decline in cheetah numbers continues across Africa, with the main threat to its survival being the encroachment of agriculture into areas formerly used by pastoralists for grazing cattle. Tim Caro of the University of California at Davis reports that uncontrolled, high-tech hunting from vehicles for dama and dorcas gazelle, important cheetah prey species, greatly contributed to the decline of the cheetah in the African Sahel.

In the early 1980s, a team of National Zoo scientists—Stephen O'Brien, David Wildt, and Mitchell Bush—discovered that cheetahs possess from 10 to 100 times less variation in their intrinsic genetic material than normally is found in other cat species. O'Brien has pointed out that one important consequence of this loss of genetic diversity is that the genes encoding components of the immune system are lost. Cheetah are therefore highly susceptible to infectious disease agents. For example, feline infectious peritonitis virus, which produces a mortality rate of one to five percent in genetically diverse domestic cats, killed 50 to 60 percent of cheetahs in recent outbreaks.

Cheetahs were exhibited as pairs of males and females throughout their history at the National and other zoos. But extensive research in Tanzania's Serengeti National Park, which began in the late 1960s and continues today by Tim Caro and

Built in 1893, the Lion House was the first permanent structure at the National Zoo. In the early years, denizens of the building were often lions from the Adam Forepaugh circus, which used the Zoo as a winter depository

for many of its animals. The Lion House was torn down in 1974, its stone walls, cement floors, and barred cages giving way to the familiar terraced lawns and moats of the William M. Mann Lion/Tiger Exhibit.



NZP Archives

his students, has painted a very different picture of cheetah social structure. Living alone unless they have cubs, female cheetahs move over huge home ranges of some 350 square miles, following the migratory Thomson's gazelle (*Gazella thomsoni*) that make up 90 percent of their diet. Females avoid one another, but their ranges extensively overlap.

Males either live alone (40 percent of the individuals), or in permanent all-male groups, known as coalitions, of two, three, or occasionally four. Lasting throughout the lifetime of the males—up to eight years in the wild—these coalitions are normally made up of litter mates but 30 percent include additional unrelated males. Like females, many males wander over large areas of the Serengeti, but about 30 percent of coalitions scent mark and actively defend their smaller, 15-square-mile territories against other males. Each territory contains cover in the form of vegetation growing in riverbeds or tall rocky outcrops; large expanses of short grasses between territories appear unsuitable for territorial occupation. At any one time, at most 10 territories in the entire Serengeti are occupied, and intense fighting for these results in high male mortality. But great reproductive benefits accrue to territory holders because female cheetahs gather temporarily at them to capitalize on the cover and a high concentration of gazelle.



Jeff Tinsley/Smithsonian Institution

More than 10 years of research by scientists at the National Zoo led to the birth of Mary Alice, the world's first "test-tube" tiger. Working with their peers at the Minnesota Zoological Garden and the Henry Doorly Zoo in Omaha, NZP scientists combined eggs from two female tigers with sperm from one male, and used a third female to carry the resulting cubs to term. Only one of the three Bengal tiger

cubs survived, but Mary Alice has brought new hope for species threatened with extinction due to dwindling numbers and lack of genetic diversity in zoo and wild populations. Scientists at the National Zoo continue to work on a variety of reproductive technologies such as sperm and embryo freezing that, it is hoped, will someday help to increase the gene pools and chances for survival of endangered species.

With this knowledge, Zoo scientists will study how size and sex composition of cheetah groups might affect their breeding in the new cheetah conservation research exhibit. Cheetahs will also be encouraged to perform the whole range of their behaviors. Animal keepers will encourage cheetahs to perform predatory behaviors, except for actual killing, on a daily basis. In the predatory sequence, cheetahs watch—stalk—visually orient—chase—knock down—and then kill prey with a suffocating throat bite. The keepers will use techniques that have been developed to train dogs, such as Afghans, that hunt by sight.

The cheetah conservation research exhibit is a new venture in zoo exhibit design, in which an older exhibit and holding facility is being transformed into a conservation research site, where Zoo visitors can see cheetahs being cheetahs and experience their behavior and ecology. Educational presentations and landscaping will focus on the links between the animals and plants that make up the cheetah's ecosystem, so visitors come away with a recognition of interdependence in biological systems and an understanding of the new technologies that are emerging to investigate and buffer environmental changes impacting endangered species.

John Seidensticker, Curator of Mammals, National Zoological Park, Smithsonian Institution

Prospects for Survival

Cats everywhere are losing ground. Of the 37 species, 22 are classified as endangered in some or all of their range and most of the rest are in some degree of trouble. Habitat loss to human economic development activities and over-

hunting—for sport, for fur, for body parts used in traditional medicine, and to protect livestock from depredation—are the chief culprits conspiring in the decline. Further, as numbers decline and populations become fragmented—cut off from other members of the species—some species are beginning to suffer from the increased reproductive failures that accompany the loss of genetic diversity due to inbreeding.

Reversing or even slowing this downward trend requires concerted action on a variety of fronts. Better enforcement of existing laws that protect cats, setting aside large areas of natural habitat for cats, and developing zoo breeding programs and artificial reproductive techniques all are important conservation measures. But ultimately, cats will only be secure when programs for their conservation are integrated into sustainable economic systems that fulfill human needs and aspirations.



Minnesota Zoological Garden

The North American lynx and the bobcat are similarly built cats that seem to have divided their ranges along a line that roughly mimics the Canada-United States border. Although the lynx has claimed the boreal forests of Canada as its home, the species is also found in parts

of some northern U.S. states. Lynx roamed the mountains of northern New York State until the 1880s, when hunting, trapping, and loss of habitat due to logging drove the cats north of the border. A century later, New Yorkers have reintroduced the lynx in wilderness areas of the

state's six-million-acre Adirondack Park. Since the winter of 1989, more than 50 lynx have been released and, although it's still too early to determine the success of the program, scientists believe that the park will one day sustain a population of up to 150 cats.

Cats, especially big cats, are increasingly confined to national parks and other protected areas. But few protected areas are large enough to support healthy populations of big cats, which may require areas of 10,000 to 20,000 square

miles for long-term survival. Many parks, like Lake Nakuru in East Africa, are effectively islands, with people eking out livings right up to the boundary fences. This small park has lost its lions and only a few leopards remain.



Susan Lumpkin



WWF/IUCN

Officials inspect a confiscated shipment of cheetah skins. This case provides an excellent example of the scope of the international trade in endangered species. The cheetahs were killed and skinned in Ethiopia, taken over the border to Djibouti, then smuggled to Hong Kong for a Swiss fur trader. The 1975 Convention on International Trade in Endangered Species (CITES) greatly reduced commerce in the

skins of cheetahs and other big cats. CITES data for 1984 show 230 cheetah skins in trade, as compared with the up to 5,000 skins traded annually during the "cat fur boom" of the late 1960s. On the other hand, the trade in small cat furs has increased to the extent that bobcats, lynx, Geoffroy's cats, and leopard cats are now among the most heavily traded felines in the world.

In India, human population growth and encroachment on tiger habitat have inevitably meant an increase in confrontations between the two species. While tigers are ultimately the losers in most of these situations, this has not been the case at the Sundarban Tiger Reserve in the Ganges Delta, where the protected cats were killing about 60 people a year in the

early 1980s. In an effort to solve the problem, a student at the Science Club of Calcutta came up with the idea of wearing human face masks on the back of the head, noting that workers in the area reported that tigers always attacked humans from behind. The ploy has been extremely successful: Over the past three years, no one wearing a mask has been killed. On the other hand, 29 people who were not wearing masks were killed by tigers during a recent 18-month period. To date, the Indian Forestry Service has issued more than 2,500 masks to workers in the area.



Peter Jackson

Challenges to Survival

Hunting for sport and fur

Lion, sand cat, most spotted cats

Conversion of tropical rainforest habitats

Tiger, jaguar, leopard, clouded leopard, African and Asian golden cats, marbled cat, ocelot, jaguarundi, margay, Geoffroy's cat, oncilla, Iriomote cat, kodkod

Conversion of tropical grasslands and dry forest

Lion, leopard, cheetah, puma, pampas cat, jaguarundi, black-footed cat

Pastoral expansion into dry and mountainous habitats

Lion, cheetah, snow leopard, puma, Pallas' cat, Chinese desert cat, sand cat, Andean mountain cat

Loss of riparian habitats

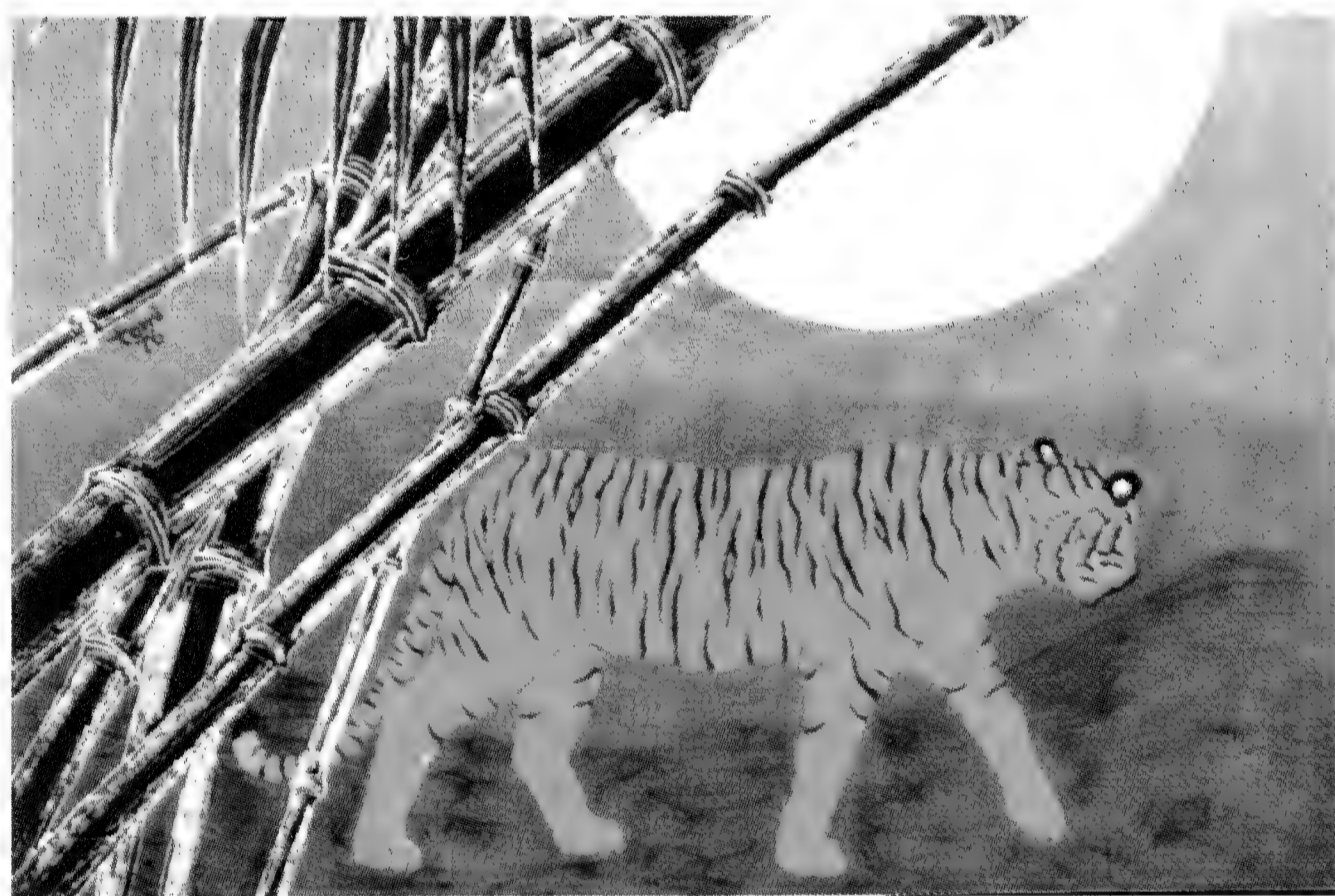
Tiger, jaguar, fishing cat, flat-headed cat

Habitat fragmentation and island isolation

Lion, cheetah, Spanish lynx, Borneo bay cat, Sumatran and Siberian tiger subspecies, Florida panther, Iriomote cat

No current major threats identified

Serval, caracal, jungle cat, wild cat, bobcat, North American lynx



John Seidensticker

Of the eight tiger subspecies, three are extinct and the remaining five are endangered. This batik from a private collection shows the Bali tiger, a subspecies that disappeared in the 1940s. The smallest of the tigers, the Bali tiger was a victim mainly of habitat encroachment by humans. The Caspian tiger became extinct probably in the 1970s, and the 1980s brought the extinction of the Javan tiger, another Indonesian island subspecies. Today, the South China tiger is on the brink of extinction,

and only the heavily protected Bengal tiger is holding its own in numbers.

Species Survival Plans for Cats

Of the five cat SSPs, the National Zoo participates in all except the snow leopard.

Asian lion

Cheetah

Clouded leopard

Tiger

Snow leopard

Through Human Eyes

The mystery and power of cats have stirred the imagination of humankind from the Ice Age to the present. Different cultures have worshipped and feared different cats, and artists have employed a variety of styles in portraying the splendor of the feline world. Artistic representations of cats may be as variable and unfathomable as the animals themselves. At any rate, the evolution of

cats in culture is a source of constant (and lucrative) amusement, and will almost certainly continue.

“Now you are a beauty!” said the Ethiopian. “You can lie out on the bare ground and look like a heap of pebbles. You can lie out on the naked rocks and look like a piece of pudding-stone. You can lie out on a leafy branch and look like sunshine sifting through the leaves; and you can lie right across the centre of a path and look like nothing in particular. Think of that and purr!”

Rudyard Kipling, “How the Leopard got his Spots,” from *Just So Stories*



John Cavallo



Ford Motor Company

Cats represent diverse products throughout the world. In the wake of the deliriously lucrative introduction of the Ford Mustang in the mid-1960s, engineers at the company's Lincoln-Mercury division tried to duplicate that success with a design of their own. According to Buz Griesinger, Lincoln-Mercury's chief engineer at the time, “We wanted a car that was

curvaceous and feline in shape and form, with a highly sculpted look.” The result was the Mercury Cougar, which sold 50,000 cars in its first six months on dealers' lots. Following the success of this model, the cougar quickly became the symbol of the entire division, with advertisements urging buyers to see their Lincoln-Mercury dealer “at the Sign of the Cat.”

When it comes to naming professional and amateur sports teams, cats are always among the most popular choices. The National Collegiate Athletic Association's handbook lists 33 colleges that have adopted lions, tigers, leopards, cougars/panthers, or wildcats as their mascots. Baseball's Detroit Tigers are one of the oldest professional teams sporting a cat nickname. A certain amount of controversy surrounds the origin of the name, with most people crediting an unknown headline

writer at the *Detroit Free Press*. A slightly more colorful version was provided by George Stallings, manager of the team in 1896, who claimed that it was his decision to outfit players in black-and-brown striped stockings that led to the creation of the nickname. According to Stallings, the stockings reminded fans of "tiger stripes."



Detroit Baseball Club



National Gallery of Art, Washington; Rosenwald; Rosenwald Collection.

Tiger; Eugene DELACROIX; c.1830.

Cats have long served as muse for painters and sculptors, and zoos have played an essential role in the depiction of cats in art. Feline forms are generally rare in Paleolithic cave art, with surviving examples perhaps most notable for their inaccuracies. This is hardly surprising because cats were far more difficult to observe at close range than such frequently depicted herbivores as

horses and wild cattle. Later artists such as George Stubbs and Eugene Delacroix based their work on live animals seen up close in zoos and private collections. While these paintings feature fairly accurate cats, the animals are often seen in rather fantastic settings, as is the case with Delacroix's *Tiger*, above. Today, Robert Bateman, Guy Coheleach, and others strive to portray realistic cats in realistic habitats.

Cats have inspired awe and reverence among their human admirers for thousands of years, and cats, big and small, have been the theme of countless books. Here are just a few titles, with a special section for children. All books are available at the Zoo Bookstore.

Children's Books

Amazing Cats. 1990. Alexandra Parsons and Jerry Young. Dorling Kindersley Limited, London. 29 pp. softbound, \$6.95. Why do leopards have spots? How do cats see in the dark? Find out in *Amazing Cats*. Along with close-up photos and humorous illustrations of cats, this book offers fun facts about nine different cat species.

Jane Goodall's Animal World—Lions. 1989. Leslie MacGuire. Atheneum, New York. 31 pp. hardbound, \$11.95. Part of the *Jane Goodall's Animal World* series, this book focuses on the day-to-day existence of the lion. Each book in this highly accessible series is written under Goodall's guidance and contains a special introduction written by Goodall. This book is divided into sections that describe the environment, evolution, senses, reproduction, family relationships, and ecological position of the lion.

Jane Goodall's Animal World—Tigers. 1990. Ruth Ashby. Atheneum, New York. 31 pp. hardbound, \$11.95.

Another installment in the *Jane Goodall's Animal World* series, this book offers a close-up look at the lives of tigers. Sections include how tigers communicate, the senses of the tiger, and protection of the tiger. A map and illustrations give readers vivid representations of the tiger's habitat, size, and family tree. Full-color photographs and an attractive presentation make tigers come alive for the young reader.

The Lion Family Book. 1988. Angelika Hofer and Gunter Ziesler. Translated by Patricia Crampton. Verlag Neugebauer Press, Salzburg, Austria. 49 pp. hardbound, \$15.95.

Candid, full-color photographs and text provide an insight into the daily life of a lion pride. The authors camped in Kenya's Masai Mara Game Reserve for one year and observed the lions in their natural habitat. The daily life of the lions is described in storybook fashion, which makes it simple enough for children but captivating for any reader.

Lions. 1981. Cynthia Overbeck and Tokumitsu Iwago. Lerner Publications Company, Minneapolis. 48 pp. hardbound, \$7.95.

Part of the Lerner Natural Science series, this book offers a fascinating glimpse into the lives of lions. *Lions* describes the birth and care of cubs, following them through their play activities. It also shows the mother seeking food for her cubs. Also included is a short glossary of key wildlife terms for the young reader.

Young Lions. 1982. Toshi Yoshida. Philomel Books, New York. 32 pp. hardbound, \$14.95.

A realistic introduction to the animals of the African plains, this book combines graceful, full-color illustrations with text to tell the story of three young lions on their first hunt. Along the way, we see them discover their world and the other animals that inhabit it.

Adult Books

Big Cats and Other Animals: Their Beauty, Dignity and Survival. 1988. Dr. Joseph R. Spies. Frederick Fell Publishers, Inc., Hollywood, FL. 207 pp. hardbound, \$29.95.

Although cats are featured in a major portion of this book, the reader will also find bears, pandas, birds, and many other animals on its pages. Spies created this book to help foster a universal appreciation for animals. Many of the photographs are of animals at the National Zoo.



John Seidensticker

Throughout the Western world, the lion is easily the most popular felid with architects and other creators of public ornamentation. The “King of Beasts” has been a symbol of courage, magnanimity, and power from the sphinxes of ancient Egypt to

Piney Branch. The Taft Memorial Bridge on Connecticut Avenue just south of the National Zoo also features several full-maned lions. In the District and elsewhere, countless pairs of sculpted lions guard the entrances to apartment buildings and private homes.

the stone lions Patience and Fortitude that adorn the steps of the New York Public Library. In Washington, D.C., the lion in this photo sits atop the bridge on 16th Street over

Humans’ fascination with the feline mystique goes back well before the current obsession. The Olmec civilization of pre-Columbian Mexico (1200-400 B.C.) was dominated by a royal lineage who emphasized their kinship ties with a race of powerful mythical jaguars. The human/jaguar union seems to have been the basis of Olmec religion, and the art of this “mother culture” of Mesoamerica was likewise dominated by rep-

resentations of “were-jaguars.” Olmec artists produced a spectrum of were-jaguar forms, from those that are nearly fully human to ones that are almost purely feline, as in the mask shown here.



Dumbarton Oaks Research Library and Collections, Washington, D.C.

Catwatching. 1986. Desmond Morris. Crown Publishers, Inc., New York. 136 pp. hardbound, \$12.95.

The original book of cat questions (serious and absurd) and answers by famed ethologist Desmond Morris. In this intriguing book, Morris reveals the truth behind a number of feline mysteries: How does a cat find its way home? Why does a cat have nine lives? Why are cat owners healthier than other people?

Catlore. 1987. Desmond Morris. Crown Publishers, Inc., New York. 180 pp. hardbound, \$12.95.

How did the Manx cat lose its tail? How did the cat become associated with witchcraft? Why are cats attracted to people who dislike them? This fascinating sequel to *Catwatching* offers answers to these and many other cat questions. Focusing on domestic cats, Morris delves into such topics as cat behavior and history.

Kingdom of Cats. 1987. Various authors. National Wildlife Federation, Washington. 204 pp. hardbound, \$24.95.

Two hundred photographs by some of the world’s finest photographers grace the pages of this book. The accompanying text, covering all of the world’s cats, is equally captivating. A section on cats and human culture chronicles how people have used cats

as symbols for everything from gods and demons to football teams, gasoline, automobiles, and movie studios.

The Serengeti Lion: A Study of Predator-Prey Relations. 1972. George B. Schaller. The University of Chicago Press, Chicago and London. 480 pp. softcover, \$24.95.

Schaller calls predators “the best wildlife managers.” In this book, he describes the effect of lions and other predators on the large wildebeest, zebra, and gazelle populations in the Serengeti. Schaller uses maps, charts, sketches, and text, along with 50 black-and-white photographs in this informative book that describes his pioneering field study of lion behavior. A classic in the field.

Soul of the Tiger. 1988. Jeffrey A. McNeely and Paul Spencer Wachtel. Doubleday, New York. 390 pp. hardbound, \$19.99.

Although not necessarily about tigers, or even cats for that matter, this book tells stories about people’s relationships to their natural environment. After spending 20 years in Southeast Asia, the authors accumulated many riveting stories about their experiences. *Soul of the Tiger* leaves the reader with not just facts about a faraway land, but with a feeling of having been there.

Tiger Moon. 1988. Fiona Sunquist and Mel Sunquist. The University of Chicago Press, Chicago and London. 187 pp. softbound, \$12.95.

This book is an account of the Sunquists’ two years among the tigers of Nepal’s Royal Chitwan National Park. During their stay, they gathered information on the tigers’ personalities, hunting habits, living arrangements, and interaction with the surrounding wildlife. Culled from Fiona Sunquist’s diary, this book is not only a highly informative study of these endangered tigers but also a personal account of living and working in Nepal.

Tigers: The Secret Life. 1989. Valmik Thapar and Fateh Singh Rathore. Rodale Press, Emmaus, PA. 160 pp. hardbound, \$35.00.

In this book, Thapar and Rathore document the lives of three tigresses and their cubs in Ranthambhore National Park in northern India, viewing every stage in the cubs’ development. The highly readable text and vivid photographs offer insight into the family life of this amazing predator and make a compelling case for tiger conservation.

—Jennifer Dawes

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